CLAIMS

I/We claim:

[c1]   1.   A method in a computer system for modeling flow of water of a site having sources of water and areas of land uses, the method comprising:

> providing objects representing areas of a land use, each object for calculating the outflow of water for that area based on an inflow of water and attributes of the object;

> providing objects representing sources of water, each object for calculating the outflow of that source of water;

> generating a graphical representation of flow of water dependencies of the areas and the sources of water, the dependencies indicating an outflow from an area or source of water to an inflow of an area, each area and water source having an associated object;

> receiving attributes describing each area and each source of water of the site; and

> performing a simulation of water flow by, for each of a plurality of time increments,

>> invoking the object associated with each source of water to calculate the outflow of that source of water for that time increment; and

>> invoking the object associated with each area in accordance with the dependencies to calculate the outflow of that area for that time increment.

[c2]   2.   The method of claim 1 wherein the areas include impervious and pervious areas.

[c3]   3.   The method of claim 1 wherein the generating of the graphical representation includes:

> providing an icon representing each area and source of water; and

receiving from a user instructions on the placement and interconnection of the icons, the interconnections representing the dependencies.

[c4]   4.   The method of claim 1 wherein the attributes of an area include size of the area.

[c5]   5.   The method of claim 1 wherein the attributes of a source of water include periodic rainfall amounts.

[c6]   6.   The method of claim 1 wherein outflow includes run off.

[c7]   7.   The method of claim 1 wherein outflow includes evapotranspiration.

[c8]   8.   The method of claim 1 wherein outflow includes infiltration.

[c9]   9.   The method of claim 1 wherein outflow includes interflow.

[c10]   10.   The method of claim 1 wherein outflow includes groundwater flow.

[c11]   11.   The method of claim 1 including:
receiving constraints;
receiving an objective function; and
repeatedly performing the simulation varying parameters within the received constraints to optimize the objective function.

[c12]   12.   The method of claim 1 wherein an area represents multiple occurrences similar areas.

[c13]   13.   The method of claim 1 wherein multiple outflows can be combined into a single outflow.

[c14]   14.   The method of claim 1 wherein an outflow can be divided into multiple outflows.

[c15]   15.   The method of claim 1 wherein objects also calculate sediment amounts.

[c16]   16.   A method in a computer system for modeling flow of water of a site having areas of each land use and sources of water, the method comprising:

> generating a graphical representation of the flow of water dependencies of areas and sources of water of the site, the dependencies indicating an outflow from an area or source of water to an inflow of an area;
>
> receiving attributes describing each area and each source of water; and
>
> performing a simulation of flow of water by, for each of a plurality of time increments,
>
>> calculating the outflow of each source of water for that time increment based on the attributes of the source of water; and
>>
>> calculating the outflow of each area for that time increment based on the inflows and attributes of that area.

[c17]   17.   The method of claim 16 wherein the generating of the graphical representation includes:

> providing an icon representing each area and water source; and
>
> receiving from a user instructions on placement and interconnection of the icons, the interconnections representing the dependencies.

[c18]   18.   The method of claim 16 wherein the attributes of an area include size of the area.

[c19]   19.   The method of claim 16 wherein the attributes of a source of water include periodic rainfall amounts.

[c20]   20.   The method of claim 16 including repeatedly performing the simulation varying parameters based on user provided constraints to optimize an objective function.

[c21]   21.   The method of claim 16 wherein the areas are pervious or impervious.

[c22]   22.   The method of claim 16 wherein an impervious area is a road.

[c23]   23.   The method of claim 16 wherein an impervious area is a roof.

[c24]   24.   The method of claim 16 wherein the generating of the graphical representation includes providing an icon for each type of impervious area.

[c25]   25.   The method of claim 16 wherein the generating of the graphical representation includes providing an icon for each type of pervious area.

[c26]   26.   A method in a computer system for modeling flow of water of a site having areas of each land use and sources of water, the method comprising:
    generating a graphical representation of the flow of water dependencies of areas and sources of water of the site, the dependencies indicating an outflow from an area or source of water to an inflow of an area;
    receiving attributes describing each area and each source of water; and
    performing a simulation of flow of water based on the attributes and dependencies of the areas and source of water.

[c27]   27.   The method of claim 26 wherein the graphical representation is generated by dragging and dropping icons representing areas of the site.

[c28]   28.   The method of claim 26 wherein the graphical representation is generated by dragging and dropping icons representing rainfall and evapotranspiration.

[c29]   29.   The method of claim 26 wherein the graphical representation is generated by connecting icons to indicate flow of water.